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ABSTRACT

Within the last 20 or 30 years, some technologies have mushroomed that have not only revolutionized the discipline and practice of librarianship and information management, but also christened our age as the Information Age. This paper identifies the technological breakthroughs that ushered in the Information Age and are transforming librarianship and information management into a high-tech profession. It also explores the implications of this metamorphosis for research, education, training, and the practice of librarianship and information management. Concluding the paper is a look into a panoramic future perspective in terms of the technologies clustering in the areas of information processing, transfer, and display; and switching speed, gate density, storage density, interface technology, and local-area networking; i.e., implications of the fifth generation computer technology for librarianship and information management. (Author/DMC)

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LIBRARIANSHIP AND INFORMATION MANAGEMENT
A HIGH-TECH PROFESSION

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ABSTRACT

Librarianship through the ages kept pace with relevant technology in managing information and delivering information services. However, from clay tablets to printing from movable types to 3" x 5" card catalog, there wasn't much that could be identified as information technology. Information came prepackaged and had to be processed and serviced more or less in its original form.

But, suddenly, within the last 20 or 30 years, some technologies have mushroomed that not only revolutionized the discipline and practice of librarianship & information management but also christened our age as Information Age.

The paper identifies the technological breakthroughs that ushered in the Information Age and are transforming librarianship & information management into a high-tech profession. It also explores the implications of this metamorphosis on research, education, training, and practice of librarianship & information management. The paper looks into a panoramic future perspective in terms of the technologies clustering in the areas of information processing, transfer, and display, and switching speed, gate density, storage density, interface technology and local-area networking. Or, in other words, implications of the Fifth Generation for Librarianship & Information Management.

INTRODUCTION

According to Susan K. Martin, "Rumor has it that library automation is mature."[1] (Martin, p.347). And librarians are eager to apply the technologies of laser disc, satellite, and database engines. Libraries with high-technology-based integrated systems and services have been envisioned. She hopes that when the Council on Library Research (CLR)-funded Linked Systems Project allows the Library of Congress, the Research Libraries Group, and the Washington Library Network to implement computer-to-computer communication in 1984, a significant barrier will indeed have been overcome.

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With the advent of the powerful microcomputers, libraries are trying to "write" local solutions to problems, an approach that reminded Martin of the library automation efforts of the 1960s that included endeavors to share or transplant systems. In the nationwide data bases, linked systems, and cooperation, she sees converging trends. These thoughts have interesting parallels in the recent developments in information science and technology.

Libraries are information handling systems. Because of the quantum leaps taken by the information technology, many systems came into being, such as Management Information Systems (MIS), Data Base Management Systems (DBMS), and information utilities, that are also basically information handling systems, but do not "look" or behave like libraries.

It is also only logical that because of the same advances in information technology, libraries are going to behave and "look" different. It truly is exciting to explore the implications of this metamorphosis on research, education, training, and practice of librarianship & information management.

High-tech is generally understood as the technology embracing computers and communications, which is also generally understood as the information technology. The appointment of John Young, president and chief executive officer of Hewlett-Packard Co., as the chair of the recently formed President's Commission on Industrial Competitiveness

probably supports that understanding. The next section identifies the recent advances and breakthroughs in information technology.

CHIP TECHNOLOGY

Chip technology is involved with microminiaturization and gate density. However from solid-state electronics it is moving to bio-electronics. The biochip will turn living organisms into microchips. That probably will mean a five hundred times reduction in size from the "traditional" silicon chips. However, we may have to wait a while for that to happen. In the meanwhile, Trilogy, Ltd. has promised last year to bring the wafer technology to the computer industry. The wafer technology puts all circuitry on a single 2.5 square-inch wafer instead of wiring the individual chips to the boards.

DISPLAY TECHNOLOGY

The cathode ray tube (CRT) has been the mainstay for soft copy display for quite a while. That made the display unit heavy and bulky. It also brought about the radiation hazard controversy. The industry and the users are looking forward to the developments in plasma, electroluminescent, and liquid crystal technology for flat-screen or flat-panel displays for computers. It has been predicted that flat-screen displays will account for 50% of the computer displays in just three years.

STORAGE

Improving storage density is as important as improving gate density. It will reduce access time and improve real-time interactive systems.

Great advancements have taken place in optical disk storage system. One such system can store approximately 4G bytes and can store images as well. The erasable optical disks are interchangeable with magnetic disk drives.

A one-hundred times increase in storage density is claimed by a technology called vertical recording technology. Reminiscent of the early days of core storage, it strives to stand bits on end rather than side by side, as on a disk, and promises 4-nano bytes of storage on one disk.

Internal (main) memory is usually volatile. For some applications, such as checking account balance, it may be very desirable to have nonvolatile memory. This can be accomplished through the use of complementary metal oxide semiconductor (CMOS). Refreshed by a very small power source CMOS can keep its memory intact.

SOFTWARE PACKAGES

Integration has become a very important concept in various areas of computing and telecommunications. It is often necessary to use a mailing list software and word processing software to generate a set of personalized formletters. Also, it is often desirable to be able to keep multiple files "open" simultaneously during a work session. Integrated software allows the user to transfer or exchange data, text, and/or graphics easily from one file to another. The technique

of windowing and split-screen display allows the manipulation of multiple files simultaneously as on a desktop.

MICRO-MAINFRAME LINK

Computing equipments and systems that were once standing alone are now being increasingly interfaced. Computer-to-computer communication has been around for some time, thanks to agencies like Advanced Research Project Agency (ARPA). But that was available only to a restricted group. Now, because of the widespread consumer-oriented data-based information services, micro-to-mainframe link has become a sorely felt necessity.

The need has been most pronounced in the areas of terminal emulation and downloading. Currently more than ten independent packaged software vendors offer micro-to-mainframe links. This also leads us into the feverishly active area of networking, because it also involves office automation.

NETWORKING

In this discussion. the terms "personal computers," "microcomputers," and "CRT terminals," are used interchangeably because the difference is blurring.

The IBM mainframes communicate with CRTs and personal computers in synchronous communications mode. But most other personal computers and CRT terminals communicate in asynchronous mode. IBM personal

Computers and CRTs communicate in Binary Synchronous Communications (BSC) networking protocol, and Systems Network Architecture (SNA). The SNA has similarities with the Open Systems Interconnect model, under development by the International Standards Organization (ISO).

A futuristic but emerging networks system called Integrated Services Digital Networks (ISDNs), will provide universal access to a wide range of business and residential communications devices. An ISDN network interface would support simultaneous circuit-switched, packet-switched, and nonswitched services. ISDN promises to provide end-to-end digital connectivity, including clear channels, digital signaling, standardized interfaces, and user control of bandwidth allocation.

The problem is that most minis and micros have only asynchronous communications capability, using low-cost interface modems transmitting at 300bps and 1200bps that can support character-at-a-time printers and terminals. They cannot use mainframe data communications protocols such as IBM's BSC, SNA/Synchronous Data Link Control (SDLC), and X.25 because these protocols require expensive synchronous interfaces and modems designed specifically for processor-to-processor communications.

Full-duplex protocols such as Blocked Asynchronous Transmission (BLAST), transmit a continuous stream of data blocks, while using the other half of the channel to receive block ACK, simultaneously, and also use sliding window or pipeline techniques. BLAST is being made available in ready-to-use packages, and promises a potential for industry standardization in asynchronous technologies.

The Open System Interconnection reference model of ISO requires that communications products be logically and structurally organized on a layered basis with different functions (such as ID check and code conversion) assigned to separate layers. It is interesting to note that as the need for micro-to-mainframe link is increasing, the difference with respect to the capability, reliability, and speed between synchronous and asynchronous systems is decreasing.

VOICE AND DATA

Separate communications solution for voice and data is not enough any more. As has been noted before, there has been a significant growth of data-based systems and services, and the trend is toward integrated voice and data systems. Ztel, Inc. and CXC Corp. recently announced their fourth generation systems using token-ring and Xerox Corp.'s Ethernet local-area networking technology.

CELLULAR RADIO

The Chicago Metropolitan Statistical Area (MSA) has introduced the first cellular radio telephone service. Cellular phones or transceivers provide mobile radio-telephone service that can hardly be distinguished from land-line service. It is also interconnected with the wire network. Spectrum management is achieved by assigning the same frequencies to the nonadjacent cells. The futurists call this the ultimate bypass technology and envision cellular wrist phones and briefcase telephones.

SATELLITE COMMUNICATIONS

It is interesting to note the current disagreement between International Satellite, Inc. (ISI) and the International Telecommunications Satellite Organization (Intelsat) that stems from ISI's proposal to FCC to launch two satellites to provide the North Atlantic region video distribution and data communication services. In Intelsat's view, the proposal violates the Communication Satellite Act's commitment to Intelsat's "single global communications system."

The controversy has political and economic implications, but the technology involved is exciting. The suggested configuration include rooftop-to-rooftop capability, i.e., one satellite hop from origin to destination, eliminating double hops and lengthy land-lines.

THE FIFTH GENERATION

All this computer and communications breakthroughs are irrevocably leading us to the fifth generation. A fifth generation processor has been defined as one that is capable of sophisticated artificial intelligence--a machine that executes logical as opposed to mathematical, calculations.[2] And artificial intelligence is defined as a subfield of computer science concerned with the concepts and methods of symbolic inference by a computer and the symbolic representation of the knowledge to be used in making inferences. A computer can be made to behave in ways that humans recognize as "intelligent" behavior in each other.[3]

Expert systems or knowledge-based systems are already in use. Despite some setbacks such as the abandonment of researching Josephson junctions, fifth generation research is continuing and all information technology research may converge into the fifth generation.

PROFESSIONAL IMPLICATIONS

The fifth generation concept transcends the electronics industry. It is equated with survival and supremacy. Undoubtedly, it is going to have fundamental and farreaching effects on mankind.

But the fifth generation is also an information machine. As information professionals we must prepare ourselves for this all-embracing machine or, in other words, for the information age, through research, education, and training so we can practice information management as true professionals.

I suppose we all understand the implications of the emerging fifth generation environment for the profession. We must recruit more students with quantitative and technological preparation, but at the same time, our faculty must prepare themselves to educate and train this new breed of students. We must also gradually move into research areas involving information technology.

This is nothing new. We knew this was coming. What is new is the urgency. The time has come to realize that we are running the risk of losing our profession by default.

REFERENCES

1. Martin, Susan K. "Convergence/Divergence: The Adolescence of Library Automation," Information Technology and Libraries. 2(4): 347-348; 1983.

2. Henkel, Tom. "Fifth-generation Computing," Computerworld. 17(52)/18(1): 66; 1983-1984.

3. Feigenbaum, Edward A. and McCorduck, Pamela. "The Fifth Generation." Reading, Mass: Addison-Wesley Publishing Company; 1983: 258.